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DEVELOPMENT OF USES SPECIFIC APTITUDE TEST BATTERY

for

LINE REPAIRER (light, heat, & power) 821.361-026

S-154R84

Developed in cooperation with the Massachusetts,
New York, Oregon, Pennsylvania, Texas, and Utah Employment Services

Analysis and Report

by

Western Test Development Field Center
Salt Lake City, Utah

U. S. DEPARTMENT OF LABOR

Employment and Training Administration
United States Employment Service

1984

DEPOSITORY

JAN 17 1985

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North

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GATB STUDY NO. 3075

DEVELOPMENT OF USES SPECIFIC APTITUDE TEST BATTERY

for

LINE REPAIRER (light, heat, & power) 821.361-026

S-154R84

RESEARCH SUMMARY

This report is designed to provide the information required to evaluate the Specific Aptitude Test Battery (SATB) for Line Repairer from two points of view: (1) technical adequacy of the research; and (2) usefulness of the battery to Employment Service staff, apprentice selection committees, and employers in selecting individuals for training as Line Repairers.

Research demonstrated a statistically significant and useful relationship between proficiency as Line Repairer Apprentice and the following Specific Aptitude Test Battery:

Aptitudes	Cutting Scores
V - Verbal Aptitude	90
N - Numerical Aptitude	85
S - Spatial Aptitude	105
K - Motor Coordination	80

The validation sample for this SATB consisted of 213 Line Repairer apprentices selected through the National Joint Apprenticeship and Training Committee Program (including 7 blacks, 8 Hispanics, 1 American Indian, and 8 French Canadians). Data were collected during 1973 to 1981. The tests used were those of the General Aptitude Test Battery (GATB) Form B-1002B. Since it was necessary for an apprentice to successfully complete both job related courses and on-the-job training, a multiple-hurdle criterion consisting of supervisory ratings and training course grades was used.

It was not technically feasible to compare the validity of the battery for minority and nonminority groups, as it was not possible to obtain data on a sufficient number of workers in any specific minority group to permit separate data analysis. Descriptive statistics for validation samples are shown in Appendix 2.

The SATB can be expected to produce a useful increase in the proportion of proficient workers. When the SATB was applied to the validation sample, composed of individuals who were employed and therefore considered competent, an increase from 68% to 82% in the proportion of proficient workers was found. A greater increase can be expected when the battery is used with applicants because the range of relevant abilities is wider among applicants than among employed workers.

PROCEDURE

A longitudinal design was used. The Joint Apprenticeship and Training Committee (JATC) referred the selected candidates for the apprenticeship program to the USES local offices for testing at the time they were admitted into the apprenticeship program. Criterion data were collected during the first year of the apprenticeship program. Local JATC representatives and State agency test research analysts collected these data.

Job Analysis

A current job description for Line Repairer was provided to all participating States. JATC officials and supervisors were consulted to ascertain that all apprentices were doing the same job and were given the same course work. The job description shown in Appendix 5 is the result of this action and may be used to provide information on the applicability of the test battery resulting from this research.

Each job duty was rated for frequency of performance, percentage of time spent, and level of difficulty as part of the job analysis. Critical job duties were identified on the basis of these ratings.

At each location at least one analyst rated each aptitude as irrelevant, important or critical to performance of the job duties. A synthesis of these ratings and their rationale follows:

S -	Spatial Aptitude	Required to visualize three-dimensional installations from blueprints, specifications, and instructions, to lay out and install underground ducts, to erect steel poles, columns, raise gin poles, and to string wire.
P -	Form Perception	Required to perceive differences or similarities in size and shape of equipment and operational processes to assure correctness of construction.
K -	Motor Coordination	Required to coordinate eye-hand movements in manipulating hand tools and accurately placing parts.
F -	Finger Dexterity	Required to manipulate tools, to splice cables and to handle implements to perform duties prescribed.
M -	Manual Dexterity	Required to pull levers, place objects, turn wheels and maneuver implements of the trade.

Experimental Test Battery

The experimental test battery for the validation sample consisted of all 12 tests of the GATB, B-1002B. Information on the composition and developmental research of the GATB may be found in the Manual for the General Aptitude Test Battery, Section III, Development, available from the Government Printing Office.

Validation Sample Description

The validation sample consisted of 213 Line Repairer apprentices employed and trained at various locations in the North, South, and West (see ACKNOWLEDGMENT). A total of 24 were minority group members (7 blacks, 8 Hispanics, 1 American Indian, and 8 French Canadians) and 189 were nonminority group members. All of the 213 subjects were male. The means and standard deviations for age and education on sample members are shown in Table 1.

All subjects, except dropouts, had been in the Line Repairer Apprenticeship program for at least one year. The Joint Apprenticeship and Training Committee (JATC) referred the selected candidates for the apprenticeship program to the local offices for testing at the time they were admitted into the apprenticeship program. This longitudinal study was initiated in 1973. The age of the apprenticeship applicant was 18 to 24 years of age and the educational requirement was high school graduation or the GED high school equivalency test.

Criteria for Validation Study

The criteria for the validation study consisted of combined supervisory ratings and test scores on 6 units of class work. The instructors sent the test scores to the test research analysts after completing each unit. The supervisory ratings were collected on the apprentice approximately one year after they were indentured into the apprenticeship program.

Supervisory ratings were obtained by means of personal visits of test research analysts to JATC coordinators and employers. The rating procedure was explained to the JATC coordinators and to first and second line supervisors of the apprentices. Each subject was rated twice by a first line supervisor with an interval of two weeks between ratings, or once each by a first line and a second line supervisor. Since sample members' aptitude test scores are confidential, supervisors had no knowledge of apprentices' aptitude test scores. Thus, the possibility of these scores affecting ratings did not exist.

A descriptive rating scale was used. The scale (See Appendix 3) consists of six items. Five of these items cover different aspects of job performance, the sixth is a global item on the Line Repairer's "all-around" ability. Each item has five alternative responses corresponding to different degrees of job proficiency. For the purpose of scoring items, weights of 1 to 5 were assigned to the responses. The total score on the rating scale is the sum of the weights for the six items. The possible range for each rating is 6-30 or 12-60 for combined ratings.

A review of the job description indicated that the items covered by the rating scale were directly related to important aspects of job duties performed by Line Repairers. Each item is relevant to the job as follows:

A - Quantity of work: A Line Repairer must work rapidly and efficiently in order to meet standards of accomplishment set for competitive contract work.

B - Quality of work: A Line Repairer's work must be of high quality to meet job specifications, local building codes and safety requirements as determined by the Occupational Safety Act of 1970.

C - Accuracy of work: A Line Repairer must be able to accurately interpret working drawings and correctly install all wiring systems according to government requirements, local codes and job specifications.

D - Job knowledge: A Line Repairer must have knowledge of materials used to install or repair systems for power generating facilities.

E - Job versatility: A Line Repairer must be capable of performing a wide variety of installation and repair tasks with many types of materials under various conditions and locations.

F - "All-around" job ability: A Line Repairer's value to the employer involves a combination of the aspects of job performance listed above.

A reliability coefficient of .80 was obtained between the two different job performance ratings, indicating a significant relationship. Therefore, the final job performance criterion consisted of the combined scores of the two ratings. The possible range for the combined scores was 12-60. The actual range for the total was 15-60. The mean was 43.3 with a standard deviation of 8.1. Table 1 shows the relationship between the job performance criterion and age and education.

Test scores were obtained from JATCs and units of class work required for first year apprentices (144 hours). Each apprentice was tested after completing each unit (6 units covering four subjects and a final test). Training course descriptions for first year Line Repairer Apprentice (See Appendix 4) were standard throughout the nation, having been coordinated through the National JATC. The actual range for the total sample was 430-600. The mean was 545 with a standard deviation of 30.0. The relationship between the related training criterion and age and education is shown in Table 1.

The correlation between the combined supervisor rating and the sum of the six unit scores was .15. Each of the two criterion is used to measure a different aspect of job performance. The fact that differential measurement was indicated and each criterion correlated significantly with most GATB aptitudes justified use of a multiple-hurdle criterion.

Because a multiple-hurdle was adopted for the study, analysts were required to determine appropriate cutting scores for the separate job-performance and course-work criteria. A cutting score of 37 for the job performance criterion together with 520 for the course work criterion placed 32% of the total sample in the low criterion group and 68% in the high criterion group.

TABLE 1

Means, Standard Deviations (SD), and Pearson Product-Moment Correlations with Course Grades (r_1) and Supervisor Ratings (r_2) for Age and Education

Validation Sample
N = 213

	Mean	SD	r_1	r_2
Age (years)	22.38	2.96	0.12	0.15*
Education (years)	12.56	1.01	0.08	0.18**

*Significant at the .05 level.
**Significant at the .01 level.

ANALYSIS

The initial step in analysis is to identify those aptitudes which show some evidence of validity and job relatedness. This evidence can be:

1. Statistical evidence of the correlation (r) between the test and the criterion.

2. Content validity as evidenced by a rating of "critical" based on the job analysis or,

3. Any combination of the following:

   -- high mean
   -- low standard deviation (SD)
   -- rating of "important" based on job analysis
   -- demonstrated validity in a prior validation study.

Statistical results for the validation sample are shown in Table 2.

TABLE 2

Statistical Results for Validation Sample

N = 213

Aptitude	Mean	SD	r1	r2
G - General Learning Ability	108.3	15.4	.16*	.38**
V - Verbal Ability	102.6	12.4	.16*	.34**
N - Numerical Aptitude	105.4	16.3	.09	.45**
S - Spatial Aptitude	113.3	17.4	.18**	.18**
P - Form Perception	117.3	17.4	.22**	.09
Q - Clerical Perception	115.2	13.7	.17**	.28**
K - Motor Coordination	105.0	14.5	.07	.20**
F - Finger Dexterity	105.3	18.6	.13*	.09
M - Manual Dexterity	115.0	19.8	.15*	.08

*Significant at the .05 level.
**Significant at the .01 level.

Table 3 summarizes the qualitative analysis and statistical results shown in Table 2 and shows the aptitudes considered for inclusion in the SATB.

TABLE 3

Summary of Qualitative and Quantitative Data
for Validation Sample

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Ratings									
Critical									
Important				X	X		X	X	X
Irrelevant									
Statistical Evidence									
High Mean					X	X			X
Low SD		X				X	X		
Significant r									
Instructor Rating	X	X	X	X		X	X		
Supervisor Rating	X	X		X	X	X		X	X
Aptitudes Considered for Inclusion in the Battery	G	V	N	S	P	Q	K	F	M

The information in Table 3 indicates that all aptitudes measured by the GATB should be considered for inclusion in the battery. The objective was to develop a battery of 2, 3, or 4 aptitudes with cutting scores at the point (a) where about the same percent would meet the cutting scores as the percent placed in the high criterion group and (b) which would maximize the relationship between the battery and the criterion.

The cutting scores were set at approximately one standard deviation below the mean aptitude scores of the sample, with deviations at five point intervals above or below these points to achieve the objectives indicated above.

The following battery resulted:

Aptitudes	Cutting Scores
V - Verbal Aptitude	90
N - Numerical Aptitude	85
S - Spatial Aptitude	105
K - Motor Coordination	80

VALIDITY OF THE BATTERY

This section of the report first presents evidence of criterion-related validity of the SATB on the validation sample. Next, it provides information on the effectiveness of test norms.

It was not technically feasible to compare the validity of the battery for minority and nonminority groups because it was not possible to obtain data on a sufficient number of workers in any specific minority group to permit separate data analysis.

Criterion Related Validity

Table 4 shows that there is a significant relationship between the job performance criterion and the SATB for the validation sample in aggregate.

TABLE 4

Validity of the Battery

Sample	N	High Criterion Group		Low Criterion Group		Chi Square	Significance level P/2	Phi Coefficient
		Below Cutting Score	Meeting Cutting Score	Below Cutting Score	Meeting Cutting Score			
Validation Total	213	37	107	45	24	30.77	.0005	.38

Multiple regression analysis was conducted between V, N, S, and K and the criterion. A multiple correlation of .39 (significant at the .005 level) was obtained between the job performance criterion and aptitudes V, N, S, and K.

Effectiveness of the Battery

The level of validity shown in Table 4 indicates that the battery will be useful in selection. In the total validation sample 68% were considered to be highly proficient. Of those who met the cutting scores, 82% were judged to be highly proficient, an increase of 14 percentage points over the existing selection method.

TABLE 5

Effectiveness of Battery

		Highly Proficient (High Criterion Group)		Marginal (Low Criterion Group)	
Selection System	Number Selected	N	% of Total	N	% of Total
Validation Sample					
Without Tests	213	144	68	69	32
With Tests	131	107	82	24	18

The research sample consisted of workers employed for one year as Line Repairer Apprentice; presumably those workers who lacked the required abilities had quit or dropped out of the apprenticeship program. Therefore, a greater increase over existing selection methods in the proportion of highly proficient workers selected is to be expected when the battery is used for selection purposes, as the range of relevant abilities is almost certainly greater among applicants than among employed workers.

Prior Battery

Analysts tested previously validated norms for Line Repairer S-154R on this validation sample. The original battery, validated in July 1958, is S-90, K-70. This battery produced a phi coefficient of .03 for the total validation sample.

Cross Validation Sample

The original sample, N=59, was gathered in one metropolitan area, at a time when no records were kept on minority composition. Analysis of the original sample with V-90, N-85, S-105, K-80 produced a phi coefficient of .14, which is not statistically significant.

Efforts to Obtain Ethnic Representation

Joint Apprenticeship Training Committee's made nationwide attempts to obtain samples with sufficient minority representation to analyze the data for fairness to minorities. Results of these attempts are shown in Appendix I. It was not technically feasible to perform an analysis of fairness to minorities as it was not possible to obtain "an adequate sample of people in each group... to achieve findings of statistical significance." (Uniform Guidelines on Employee Selection Procedures, Section 14.B.8(e). As the Uniform Guidelines, Section 14.B.8(f), permit the use of a test when a fairness analysis is not technically feasible, but the validity evidence otherwise meets the requirements of the Guidelines, this is an unrestricted battery.

In addition, Section 14.B.8(b) of the Guidelines states that, "where the weight of evidence from other studies shows that the selection procedure predicts fairly for the group in question and for the same or similar jobs, such evidence may be relied on in connection with the selection procedure at issue." Such evidence is outlined below.

Much research has been conducted to determine the extent to which minority and nonminority validities differ for the abilities measured on the GATB. A cumulative study combining all available SATB validation samples within the U.S. Employment Service Data Bank concluded that "differential validity probably does not exist in sufficient magnitude to moderate validity to any appreciable or practical degree." (J. Hawk, 1983) This finding replicates those of other researchers. For instance, Hunter, Schmidt and Hunter (1979) examined 866 validity coefficients in a comprehensive review concluding that there was no evidence to establish true differential validity. These findings, based on massive amounts of data, support Humpreys' (1973) conclusion that there is little likelihood that minorities are not part of the same population as the majority, and a test that is valid for the majority is also valid for minorities.

This cumulative evidence has also led to similar conclusions by the National Research Board, "we find little convincing evidence that well constructed and competently administered tests are more valid for one population subgroup than for another: individuals with higher scores tend to perform better on the job regardless of group identity." The APA Division 14 Principles (1980) contain the following: "Because many characteristics studied appear to have little or no effect on predictor-criteria relationships, no variable should be assumed to moderate validities in the absence of explicit evidence for such an effect. For example, the research literature shows that validities within races (black vs. white) are usually comparable on cognitive selection tests."

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APPENDIX I

NATIONAL JOINT APPRENTICESHIP & TRAINING COMMITTEE'S REPORTS OF APPLICANTS IN LINE REPAIRER STUDY BY CENSUS REGION 1973-1981

	NORTH		SOUTH		WEST		NATIONAL TOTAL	
	NON-MIN.	MIN.	NON-MIN.	MIN.	NON-MIN.	MIN.	NON-MIN.	MIN.
Total applicants who applied for Line Repairer Study 1973-1981	11,135	1,815	2,368	178	1,028	69	14,531	2,062
Number of applicants indentured in Line Repairer Study 1973-1981	1,518	114	765	66	249	12	2,532	192
Number of applicants who left Line Repairer Study During the First Year 1973-1981	426	53	137	22	50	5	613	80

Note: The minority columns include only Black and Hispanic applicants.

APPENDIX 2

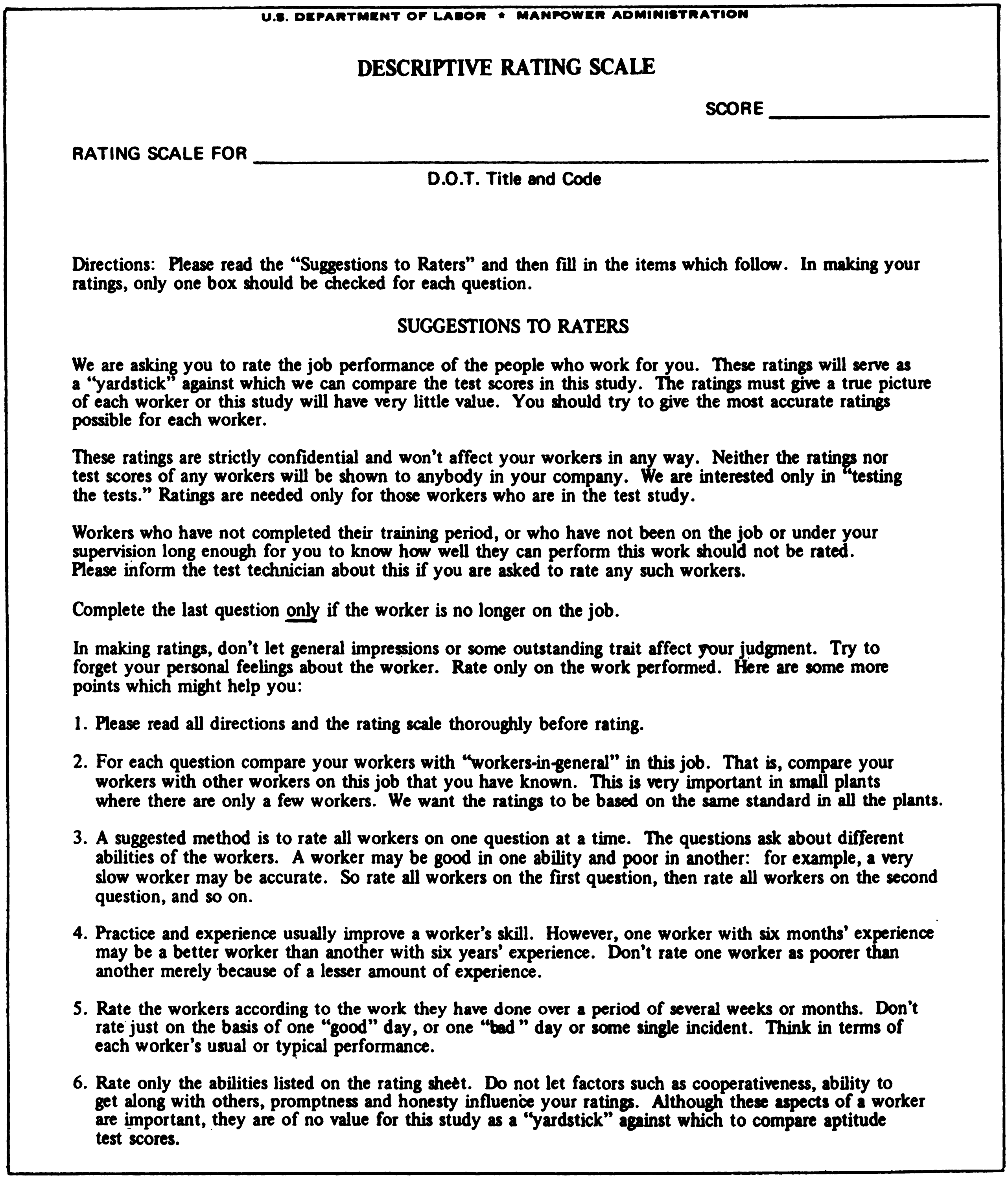
DESCRIPTIVE STATISTICS FOR VALIDATION SAMPLE

N = 213

Variable	Mean	SD	Range	r_1	r_2
Aptitude G	108.3	15.4	69-168	.16*	.38**
Aptitude V	102.6	12.4	65-156	.16*	.34**
Aptitude N	105.4	16.3	59-154	.09	.45**
Aptitude S	113.3	17.4	71-153	.18**	.18**
Aptitude P	117.3	17.4	68-165	.22*	.09
Aptitude Q	115.2	13.7	71-172	.17*	.28**
Aptitude K	105.0	14.5	70-146	.07	.20**
Aptitude F	105.3	18.6	46-171	.13*	.09
Aptitude M	115.0	19.8	66-186	.15*	.08
Age (years)	22.38	2.96	18- 32	.12	.15*
Education (years)	12.56	1.01	9- 16	.08	.18**

*Significant at the .05 level
**Significant at the .01 level

APPENDIX 3



U.S. DEPARTMENT OF LABOR ★ MANPOWER ADMINISTRATION

DESCRIPTIVE RATING SCALE

SCORE ______________________

RATING SCALE FOR ____

D.O.T. Title and Code

Directions: Please read the "Suggestions to Raters" and then fill in the items which follow. In making your ratings, only one box should be checked for each question.

SUGGESTIONS TO RATERS

We are asking you to rate the job performance of the people who work for you. These ratings will serve as a "yardstick" against which we can compare the test scores in this study. The ratings must give a true picture of each worker or this study will have very little value. You should try to give the most accurate ratings possible for each worker.

These ratings are strictly confidential and won't affect your workers in any way. Neither the ratings nor test scores of any workers will be shown to anybody in your company. We are interested only in "testing the tests." Ratings are needed only for those workers who are in the test study.

Workers who have not completed their training period, or who have not been on the job or under your supervision long enough for you to know how well they can perform this work should not be rated. Please inform the test technician about this if you are asked to rate any such workers.

Complete the last question only if the worker is no longer on the job.

In making ratings, don't let general impressions or some outstanding trait affect your judgment. Try to forget your personal feelings about the worker. Rate only on the work performed. Here are some more points which might help you:

1. Please read all directions and the rating scale thoroughly before rating.
2. For each question compare your workers with "workers-in-general" in this job. That is, compare your workers with other workers on this job that you have known. This is very important in small plants where there are only a few workers. We want the ratings to be based on the same standard in all the plants.
3. A suggested method is to rate all workers on one question at a time. The questions ask about different abilities of the workers. A worker may be good in one ability and poor in another: for example, a very slow worker may be accurate. So rate all workers on the first question, then rate all workers on the second question, and so on.
4. Practice and experience usually improve a worker's skill. However, one worker with six months' experience may be a better worker than another with six years' experience. Don't rate one worker as poorer than another merely because of a lesser amount of experience.
5. Rate the workers according to the work they have done over a period of several weeks or months. Don't rate just on the basis of one "good" day, or one "bad" day or some single incident. Think in terms of each worker's usual or typical performance.
6. Rate only the abilities listed on the rating sheet. Do not let factors such as cooperativeness, ability to get along with others, promptness and honesty influence your ratings. Although these aspects of a worker are important, they are of no value for this study as a "yardstick" against which to compare aptitude test scores.

MA 7-66
Apr. 1973

NAME OF WORKER *(Print)* *(Last)* *(First)*

SEX: **MALE**________ **FEMALE**________

Company Job Title: ____

How often do you see this worker in a work situation?	How long have you worked with this worker?
☐ All the time.	☐ Under one month.
☐ Several times a day.	☐ One to two months.
☐ Several times a week.	☐ Three to five months.
☐ Seldom.	☐ Six months or more.

A. How much can this worker get done? (Worker's ability to make efficient use of time and to work at high speed.) (If it is possible to rate only the quantity of work which a person can do on this job as adequate or inadequate, use #2 to indicate "inadequate" and #4 to indicate "adequate.")

☐ 1. Capable of very low work output. Can perform only at an unsatisfactory pace.

☐ 2. Capable of low work output. Can perform at a slow pace.

☐ 3. Capable of fair work output. Can perform at an acceptable pace.

☐ 4. Capable of high work output. Can perform at a fast pace.

☐ 5. Capable of very high work output. Can perform at an unusually fast pace.

B. How good is the quality of work? (Worker's ability to do high-grade work which meets quality standards.)

☐ 1. Performance is inferior and almost never meets minimum quality standards.

☐ 2. Performance is usually acceptable but somewhat inferior in quality.

☐ 3. Performance is acceptable but usually not superior in quality.

☐ 4. Performance is usually superior in quality.

☐ 5. Performance is almost always of the highest quality.

C. How accurate is the work? (Worker's ability to avoid making mistakes.)

☐ 1. Makes very many mistakes. Work needs constant checking.

☐ 2. Makes frequent mistakes. Work needs more checking than is desirable.

☐ 3. Makes mistakes occasionally. Work needs only normal checking.

☐ 4. Makes few mistakes. Work seldom needs checking.

☐ 5. Rarely makes a mistake. Work almost never needs checking.

MA 7-66
Apr. 1973

D. How much does the worker know about the job? (Worker's understanding of the principles, equipment, materials and methods that have to do directly or indirectly with the work.)

☐ 1. Has very limited knowledge. Does not know enough to do the job adequately.

☐ 2. Has little knowledge. Knows enough to get by.

☐ 3. Has moderate amount of knowledge. Knows enough to do fair work.

☐ 4. Has broad knowledge. Knows enough to do good work.

☐ 5. Has complete knowledge. Knows the job thoroughly.

E. How large a variety of job duties can the worker perform efficiently? (Worker's ability to handle several different operations.)

☐ 1. Cannot perform different operations adequately.

☐ 2. Can perform a limited number of different operations efficiently.

☐ 3. Can perform several different operations with reasonable efficiency.

☐ 4. Can perform many different operations efficiently.

☐ 5. Can perform an unusually large variety of different operations efficiently.

F. Considering all the factors already rated, and only these factors, how good is this worker? (Worker's all-around ability to do the job.)

☐ 1. Performance usually not acceptable.

☐ 2. Performance somewhat inferior.

☐ 3. A fairly proficient worker.

☐ 4. Performance usually superior.

☐ 5. An unusually competent worker.

Complete the following ONLY if the worker is no longer on the job.

G. What do you think is the reason this person left the job? (It is not necessary to show the official reason if you feel that there is another reason, as this form will not be shown to anybody in the company.)

☐ 1. Fired because of inability to do the job.

☐ 2. Quit, and I feel that it was because of difficulty doing the job.

☐ 3. Fired or laid off for reasons other than ability to do the job (i.e., absenteeism, reduction in force).

☐ 4. Quit, and I feel the reason for quitting was not related to ability to do the job.

☐ 5. Quit or was promoted or reassigned because the worker had learned the job well and wanted to advance.

RATED BY	TITLE	DATE
COMPANY OR ORGANIZATION	LOCATION *(City, State, ZIP Code)*	

APPENDIX 4

TRAINING COURSE DESCRIPTION FOR FIRST YEAR LINE REPAIRER APPRENTICESHIP

--144 hours--

First year apprentices receive instructions as described below in order to successfully complete apprenticeship training and become a journeyman Line Repairer. Training course descriptions for first year Line Repairer Apprentice were standard throughout the nation, coordinated through the National JATC. There are 6 units of class work (144 hours) covering basic tools and job information, safety, mathematics and theory.

BASIC JOB INFORMATION Training units of class work are given on the basic tools and job information needed to successfully complete the training: Tools; poles; unloading poles; framing and hauling poles; digging holes; setting poles; climbing poles; rope; blocks and slings; guy types; guy installation; guy strength and sizes; anchors; line conductors; crossarms and attachments; mounting crossarms; pins and insulators; climbing equipment inspection and care; wire sizes; stringing wires; tying in; hand signals; good housekeeping; tree trimming; overhead service.

SAFETY Safety instructions in: developing safe working attitudes and recognizing unsafe working conditions; first aid, bleeding and its control; safety procedures and proper use of hats; cutouts; and ladders.

MATHEMATICS A review of basic math processes: addition and subtraction; multiplication and division; fractions; decimals; simple equations; mathematics for parallel circuits; percentage; ratio and proportions.

THEORY Instructions on the electric system: electricity and matter; electrical units; Ohm's Law; series circuits; parallel resistances; parallel circuits; combination circuits; mechanical work and force; electrical power; batteries; fuse principles; principles of magnetism; electricity and magnetism; magnetic circuits; transformers; wire resistance; voltage drop; principles of generation.

APPENDIX 5

JOB DESCRIPTION

Job Title

Line Repairer (light, heat, & power) 821.361-026

Guide for Occupational Exploration (GOE) Code 05.05.05; Electrical-Electronic Systems Installation and Repair

Job Summary:

Performs all operations of work entailed in the transmission, distribution, substation, and underground phases of installation, repair, replacements, and maintenance of the supply of electrical power from the power plant to the consumer.

Work Performed:

Erects steel towers, poles, and extensions, attaches cross-arms, insulators, and other equipment, and strings wire to transmit high voltage electric current from generating system to substation and/or between substations.

Climbs poles or rides in bucket attached to truck mounted boom to remove broken or defective wires, secures new wires to cross-arm insulators and splices wires to adjoining sections of line to complete circuit. Suspends insulated ladders and platforms from pole cross-arms and covers energized lines with rubber mats to facilitate safe handling of high-voltage lines without interrupting service by power shutoff. Uses long insulated poles fitted with mechanically or hydraulically operated grasping and crimping tools.

Erects steel columns, towers, trusses, and buses; assembles gears; installs switches; hooks up transformers, oils circuit breakers and controls.

Lays out and installs duct, inserts cable to transmit electrical energy underground, and connects conductors to terminals. Repairs energized or de-energized conductors suspended from electrically conductive metal towers, commonly one-hundred feet or more above the ground.